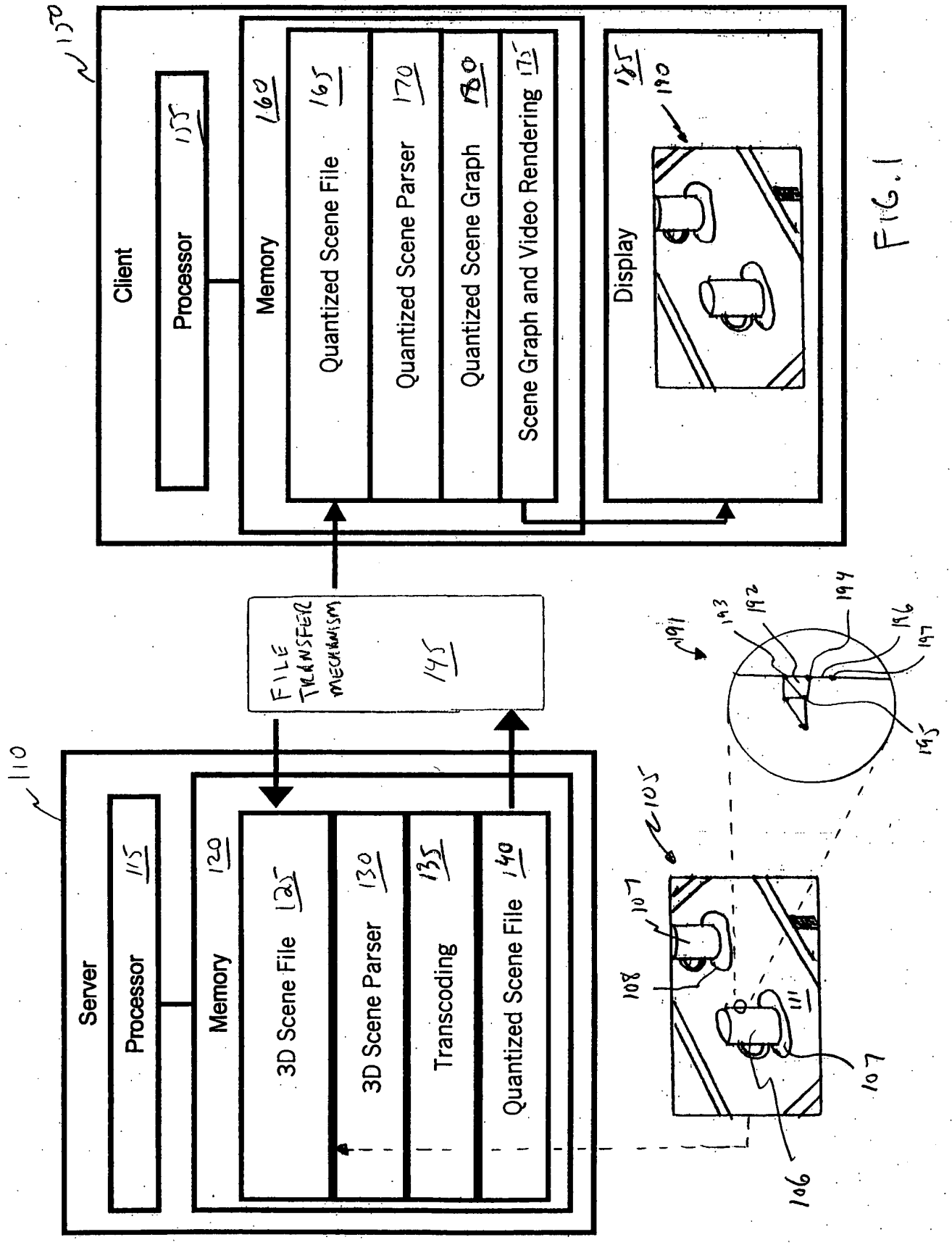
Client
Processor
Memory
Quantized Scene File
Quantized Scene Parser
Quantized Scene Graph
Scene Graph and Video Rendering
Display
FILE TRANSFER MECHANISM
Server
Processor
Memory
3D Scene File
3D Scene Parser
Transcoding
Quantized Scene File

FIG. 1

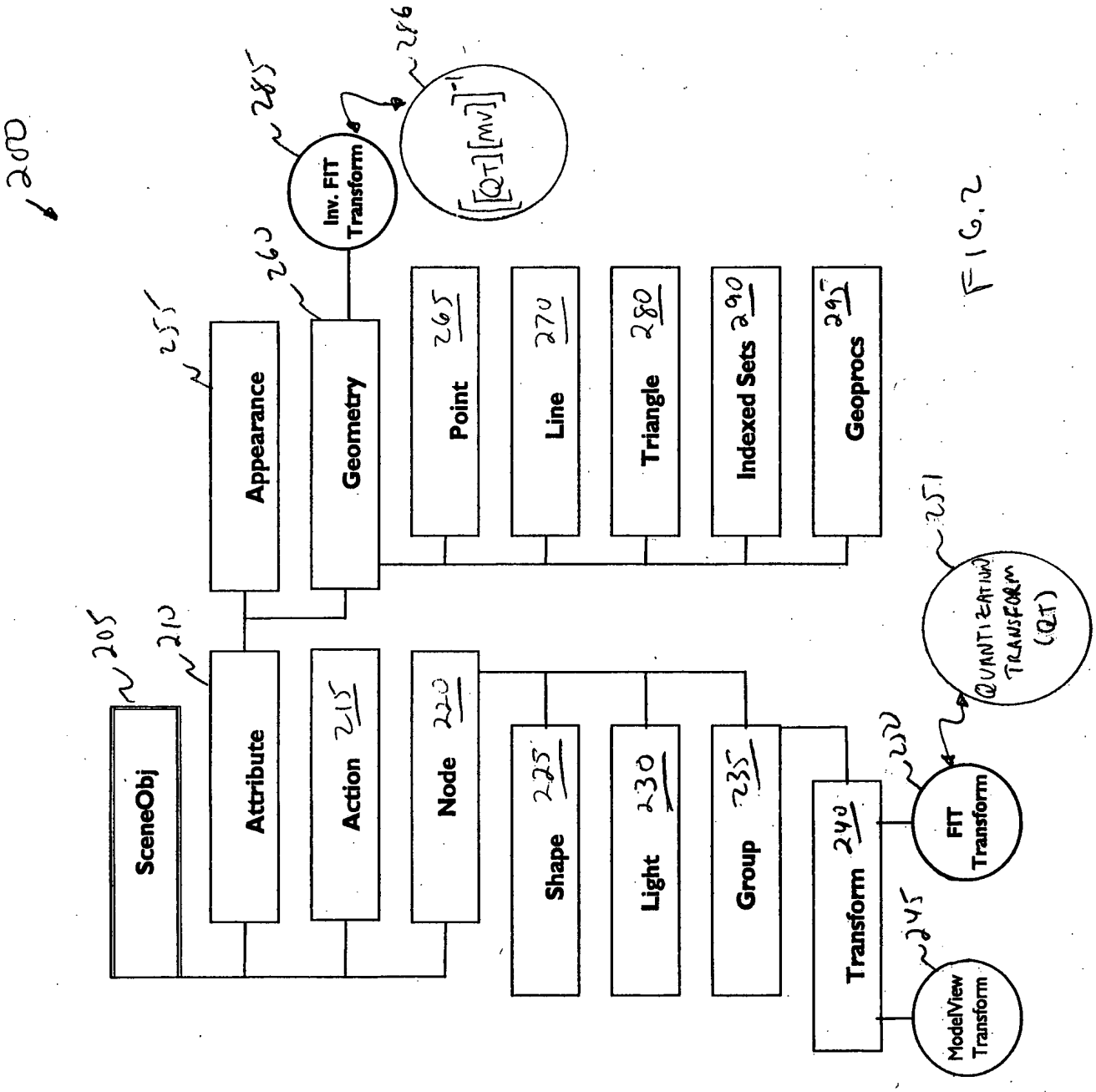
200
SceneObj
205
Attribute
210
Appearance
255
Action
215
Node
220
Geometry
260
Shape
225
Light
230
Group
235
Transform
240
Point
265
Line
270
Triangle
280
Indexed Sets
290
Geoprocs
295
Inv. FIT Transform
285
[QT][MV]^-1
286
QUANTIZATION TRANSFORM (QT)
251
FIT Transform
250
ModelView Transform
245

FIG. 2

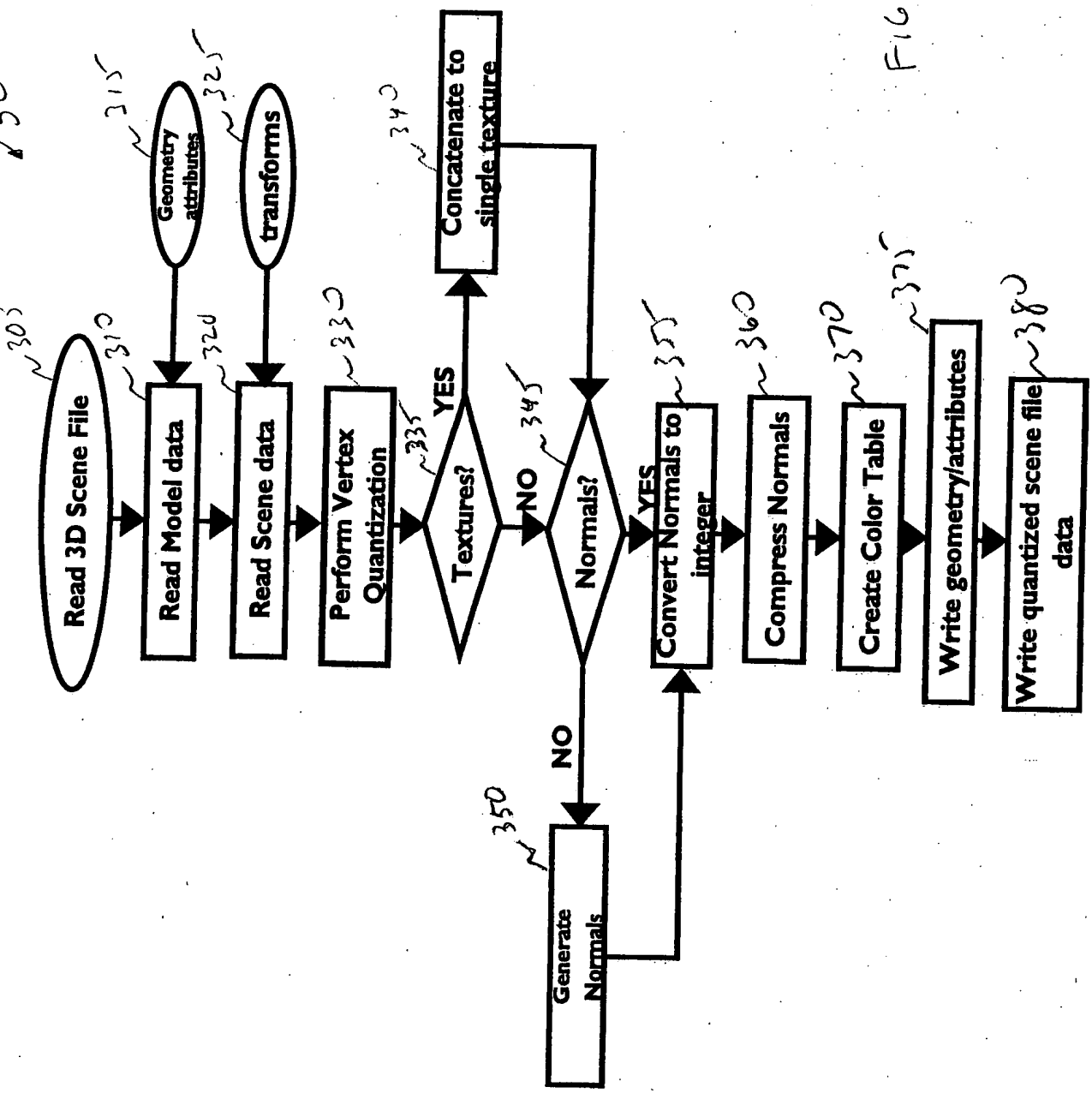
300
305
Read 3D Scene File
310
Read Model data
315
Geometry attributes
320
Read Scene data
325
transforms
330
Perform Vertex Quantization
335
Textures?
YES
340
Concatenate to single texture
NO
345
Normals?
YES
350
Generate Normals
NO
355
Convert Normals to integer
360
Compress Normals
370
Create Color Table
375
Write geometry/attributes
380
Write quantized scene file data

FIG. 3

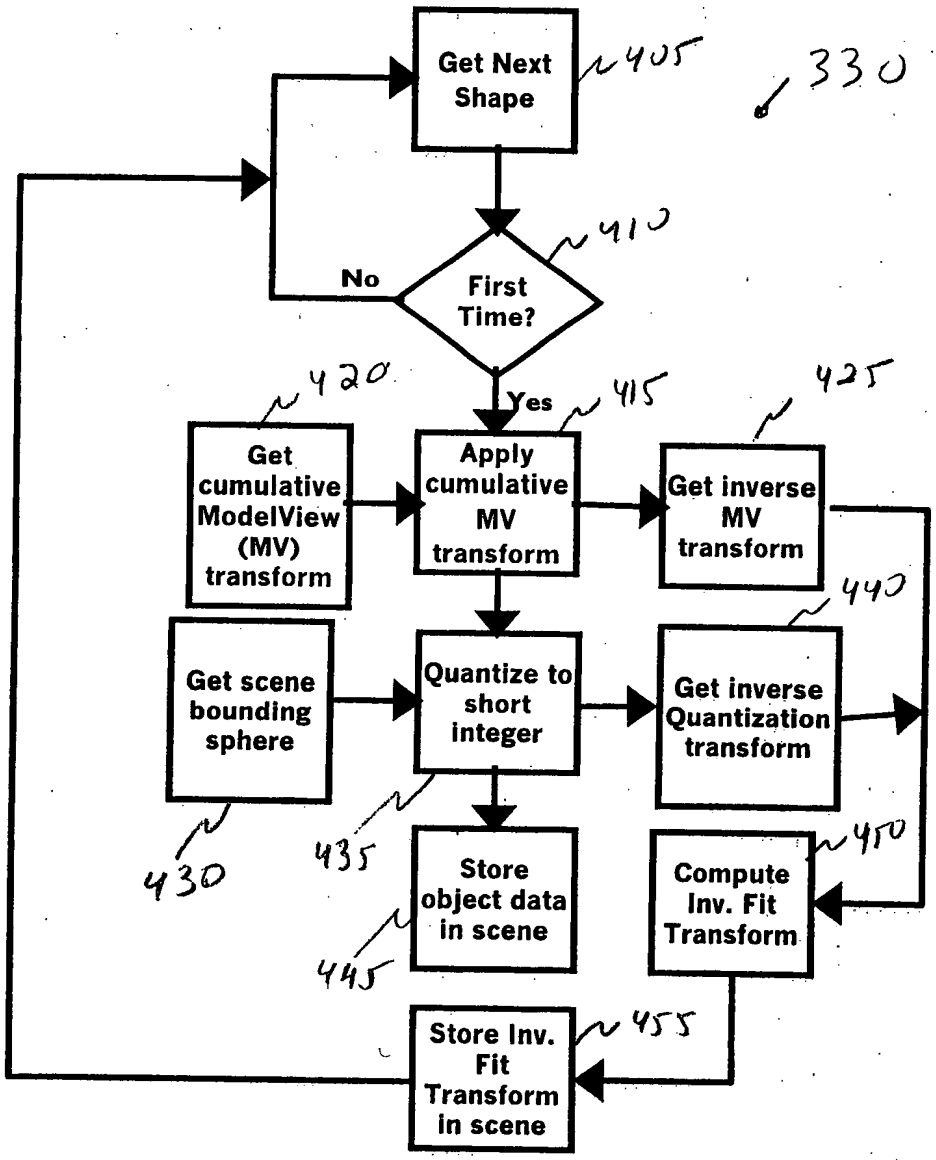
Get Next Shape
405
330
First Time?
410
No
Yes
Get cumulative ModelView (MV) transform
420
Apply cumulative MV transform
415
Get inverse MV transform
425
Get scene bounding sphere
430
Quantize to short integer
435
Get inverse Quantization transform
440
Store object data in scene
445
Compute Inv. Fit Transform
450
Store Inv. Fit Transform in scene
455

FIG. 4A

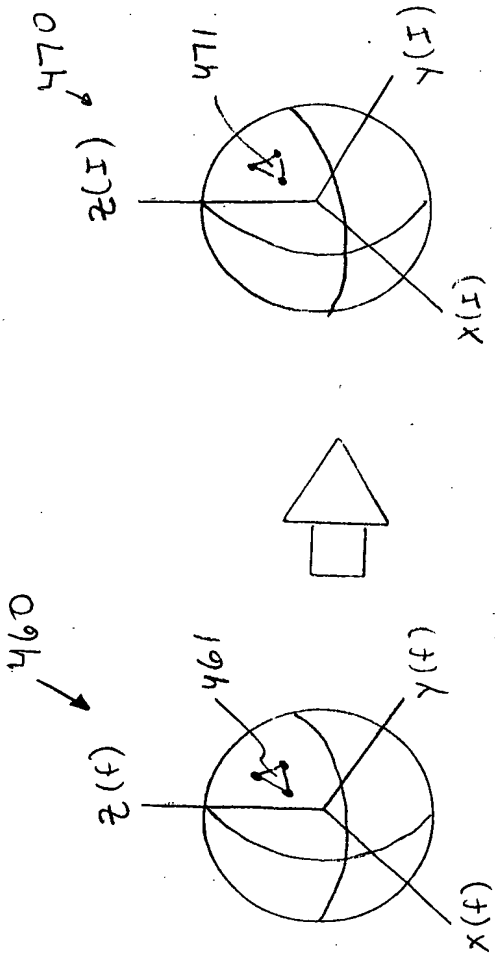

FIG. 4B

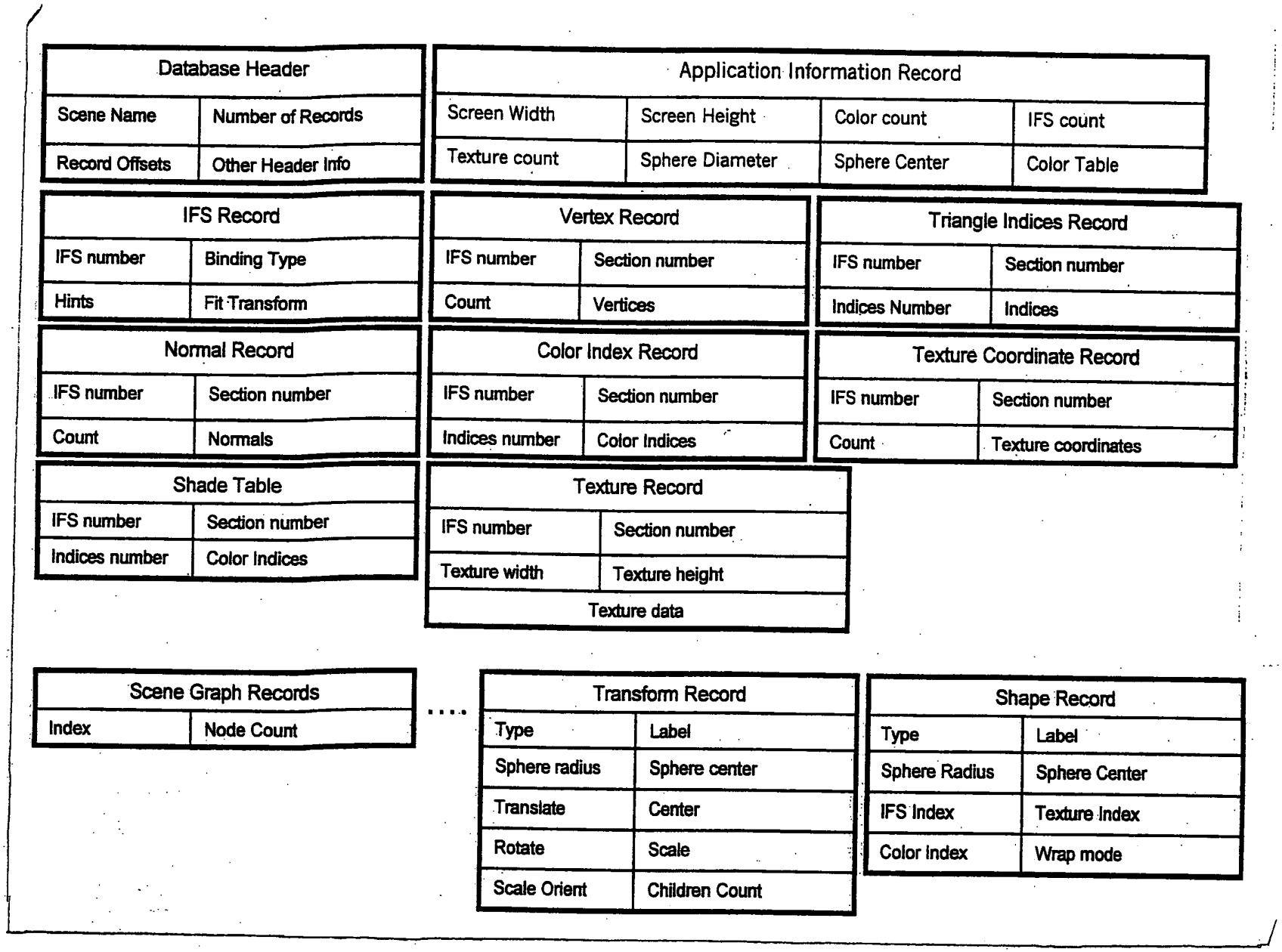
Database Header
Scene Name
Number of Records
Record Offsets
Other Header Info
Application Information Record
Screen Width
Screen Height
Color count
IFS count
Texture count
Sphere Diameter
Sphere Center
Color Table
IFS Record
IFS number
Binding Type
Hints
Fit Transform
Vertex Record
IFS number
Section number
Count
Vertices
Triangle Indices Record
IFS number
Section number
Indices Number
Indices
Normal Record
IFS number
Section number
Count
Normals
Color Index Record
IFS number
Section number
Indices number
Color Indices
Texture Coordinate Record
IFS number
Section number
Count
Texture coordinates
Shade Table
IFS number
Section number
Indices number
Color Indices
Texture Record
IFS number
Section number
Texture width
Texture height
Texture data
Scene Graph Records
Index
Node Count
....
Transform Record
Type
Label
Sphere radius
Sphere center
Translate
Center
Rotate
Scale
Scale Orient
Children Count
Shape Record
Type
Label
Sphere Radius
Sphere Center
IFS Index
Texture Index
Color Index
Wrap mode

FIG. 5

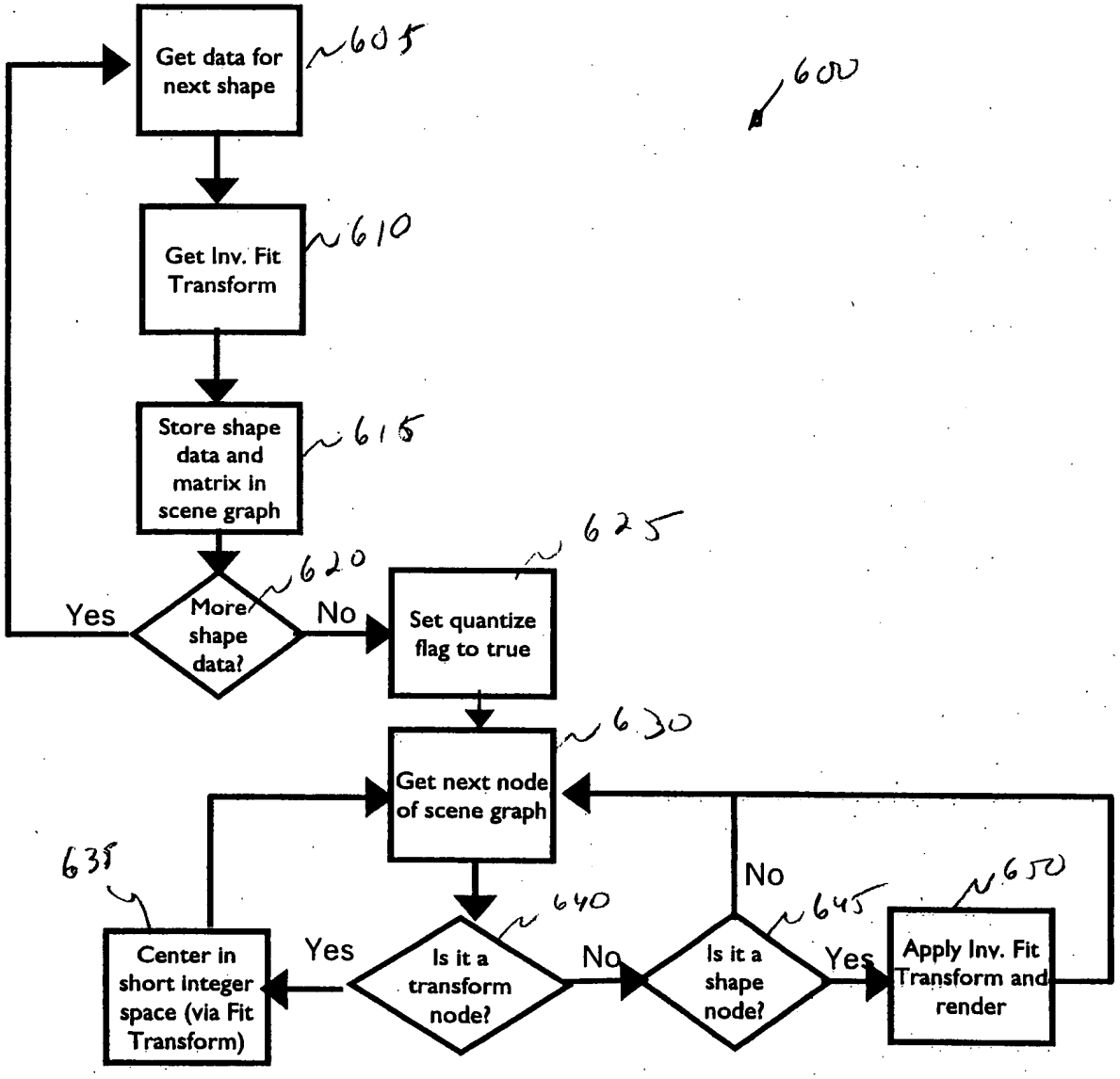
600
Get data for next shape
605
Get Inv. Fit Transform
610
Store shape data and matrix in scene graph
615
More shape data?
620
Yes
No
Set quantize flag to true
625
Get next node of scene graph
630
Is it a transform node?
640
Yes
No
Center in short integer space (via Fit Transform)
635
Is it a shape node?
645
No
Yes
Apply Inv. Fit Transform and render
650

FIG. 6